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| Use the Van de Walle text and the TN Math Standards to complete this assignment. If other resources are used in addition, please cite with the URL or bibliographic information. |

**Chapter 14 – Algebraic Thinking, Equations, and Functions**

1. Algebraic Thinking pervades all mathematics and is essential for making it useful in daily life. **Three Strands of algebraic reasoning** that integrate generalization & symbolization are:

*Structure in the Number System: Connecting Number and Algebra*

1. Three ways to connect number and Algebra

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| **Number Combinations** | In early grades students can…  Students can describe a pattern with… |
| **Place-Value Relationships** | Describe ways the hundreds chart can be used to focus on algebraic thinking. |
| **Algorithms** | As students explain how they solved a problem, record their ideas using…  What questions can you ask to help students make generalizations? |

*Structure in the Number System: Properties*

1. Define conjecture (look up if necessary).
2. Download the “Conjecture Cards” linked to Activity 14.4 on page 307 in the digital text. Select one Addition/Subtraction and one Multiplication/Division conjecture and test the conjecture. Show your work on paper – take a picture and include below.

*Study of Patterns and Functions*

1. Define repeating patterns. What is an example of a core? Give an example of creating a repeating pattern with manipulatives, verbally, or with body movements.
2. Use the color patterns NLVM applet to complete several patterns or create your own pattern with the pattern blocks applet. Take a screenshot and include below.

Color Patterns

<http://nlvm.usu.edu/en/nav/frames_asid_184_g_1_t_2.html?from=topic_t_2.html>

Pattern Blocks

<http://nlvm.usu.edu/en/nav/frames_asid_169_g_1_t_2.html?open=activities&from=topic_t_2.html>

1. Define growing patterns. (p. 310)
2. Take the growing patterns practice quiz for K-2.

<http://mathgames4children.com/quiz-k-to-2/Growing%20patterns/patterns.html>

How did you perform? What aspects of geometric patterns make these good examples to use? How could you differentiate instruction for growing patterns to make them more challenging? (p. 310)

*Meaningful Use of Symbols*

1. Describe two different ways teachers can address misconceptions with the equal sign or other math symbols. Give an example for each. (p. 320-321)
2. How does a balance help students develop conceptual understanding of the equal sign? (p. 322-323)
3. Play PBS Cyberchase Poddle Weigh-In. How does this game help develop understanding of the equal sign?

<http://pbskids.org/cyberchase/math-games/poddle-weigh-in/>

1. What is the difference between an algebraic expression and an algebraic equation? (*May need to look this one up*.)
2. Compare and contrast how true/false sentences are used to help develop understanding of the equal sign.
3. List and describe the three ways students may think about equations. (p. 326)
4. *The Meaning of Variables*

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|  | Provide Example of this meaning from the text. |
| Variables used as unknown value (p. 328-329) |  |
| Simplifying Expressions and Equations (p. 330-331) |  |
| Variables used as quantities that vary (p. 332- |  |

*Mathematical Modeling*

1. Math models are not to be confused with… (p. 334)

They allow us to find values that… (p. 334)

*Algebraic Thinking Across the Curriculum*

1. How can student explore algebra using data and experiments?

**Chapter 23 – Order of Operations p. 584-586**

1. Order of operations is not just a convention, it is based on…. (p. 584)
2. How can the mnemonic PEMDAS be misleading? How can a visual be more effective? (p. 585) Take a screenshot of an example visual that you find helpful – include below.
3. Play the Order of Operations Millionaire Game from Math-Play. Take a screen-shot showing how far you get and insert below.

<http://www.math-play.com/Order-of-Operations-Millionaire/order-of-operations-millionaire-game.html>